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ABSTRACT

This report deals principally with modular homes (permanently sited structures) although it also presents some recent information on mobile homes. In 1976, modular home construction companies were surveyed in Texas and across the United States to assess the extent of their construction activity and market penetration and to gather some insight into the future of modular residential construction. A questionnaire was sent to 196 manufacturers. Of these, 77 responses were received and 48 had useable information. One manufacturer was producing units to be used as motels, schools, and townhouses. Information requested covered a wide range of topics including individual contruction techniques, square footages, features, per-unit costs, financing methods, sales and aggregation of markets, average shipping distances, unit merchandising, and assessment of effects of added government regulation, emerging trends, and indications of the nature and extent of future industry problems. (Author/MLF)

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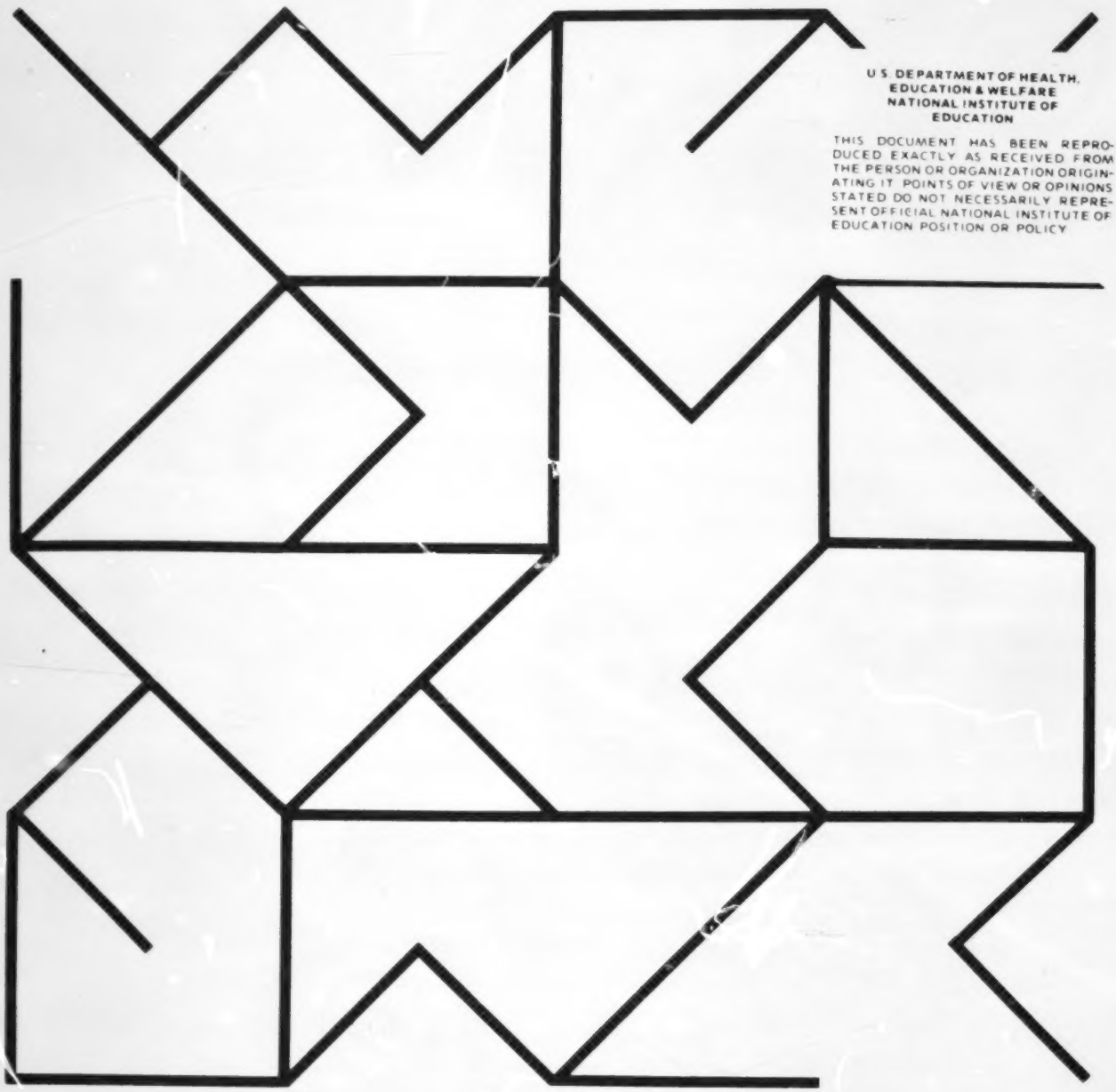
MANUFACTURED HOUSING
THE MODULAR HOME IN TEXAS



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MANUFACTURED HOUSING -- THE MODULAR HOME IN TEXAS

*By Roger P. Sindt**

INTRODUCTION

Manufactured housing in Texas, which includes both mobile and modular construction, has accounted for an increasingly large percentage of the housing inventory since 1970. For example, the mobile home segment of manufactured housing accounted for 47 percent of all single-family homes built in Texas in 1972. By 1976, double-wide mobile and modular homes were adding another 5 or 6 percent.

Manufactured housing has undergone rapid change in the decade of the 1970's. The product has met increasing consumer acceptance and has virtually been the only new housing available in the under-$15,000 market and the majority of the $15,000 to $20,000 market. Manufactured housing has been recognized as a primary answer to the housing needs for households in the $20,000-and-under market.

In addition, it has been estimated that more than 50 percent of all new conventional housing now contains major manufactured (prefabricated) components. This suggests that the home construction industry is changing at a fairly rapid rate and holds promise for much more innovation.

This report deals principally with modular homes (permanently sited structures) although it also presents some recent information on mobile homes.

CHANGING DEMAND FOR HOUSING

Today's dynamically changing lifestyles have much potential for affecting future housing demand. In the long run, it is anticipated that more childless and single-person households will cause the average household size to decline dramatically.

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The 1970 household averaged 3.17 persons but declined to 3.0 by 1974. Some estimate it will drop below 2.7 by 1985. These smaller households could demand smaller living units, thus decreasing the need for bedrooms, larger lot sizes and other space-using requirements.

Economic factors also cause changes in tastes and preferences. Higher energy costs, coupled with the declining availability of certain energy sources, will influence housing needs and effective demand in the future. The prospect of reallocating incomes from other goods and services to housing could become a reality if housing costs continue to increase faster than the general inflationary rate. Higher utility costs are only part of the overall problem while other life-cycle costs, such as principal, interest and tax payments, continue to be the largest categories of home ownership expense.

Some technological changes and relaxation of governmental requirements have the potential to relieve those problems. High on the list are the restraints imposed by many well meaning but severely outmoded zoning ordinances and restrictive practices resulting from building code burdens. Many of these requirements have prevented or prohibited the aggregation of markets necessary to support cost-reducing technology.

THE DEVELOPMENT OF MODULAR HOUSING

Manufactured housing in various forms has been available in the United States for some time. Records revealed by the *Scientific American* in 1886 show a portable barrack and field hospital designed for the Department of Defense. Some suggest the early settlers had the original prefabricated shelter in the form of the covered wagon.

The manufactured housing industry has evolved through several stages. The first manufacturing efforts were mobile homes. Early units were called trailers

and generally were little more than enclosed moveable spaces which included sleeping and sitting quarters. The house trailer, with little basic change, was produced into the 1950's. In the early 1960's, the mobile home was constantly re-designed and re-engineered, making it more durable and spacious while providing the same amenities as conventionally constructed housing. By the early 1970's more than 500,000 units were being produced yearly in the United States. Production in Texas reached a high of 44,000 units in 1972 (a year in which an additional 49,000 conventional site-built homes were constructed in the state).

As mobile units grew in size, they became more difficult to move from site to site. Consequently, the average mobile home is rarely moved once sited, although it usually retains its easy movability. Increasing interest has been shown in the modular home as an alternative to the mobile home and more especially to the high cost of conventional housing, particularly in the under-$25,000 market. In this market segment there is little competition from site-built, conventional housing. The public has held the negative opinion, which is slowly dissipating, that mobile homes were considered to be temporary housing. Thus, a new form of siting (e.g., factory construction, but on a permanent foundation) could create a new product without historical bias.

Other factors have played key roles in modular home design and development. The Department of Housing and Urban Development's Operation Breakthrough in the late 1960's was the first major effort to identify innovative, industrialized, housing manufacturing processes. Although the industry was provided with much needed visibility through that research project, it has not been until the last several years that modular units have become a significant market possibility. This market potential has evolved because of the growing gap between manufactured and site-built housing costs.

Federal standards for the mobile home segment of manufactured housing went into effect in 1976 which almost guaranteed a minimum quality and uniform product. The additional success of some manufacturers in receiving Structural Engineering Bulletin approval from HUD has virtually insured favorable financing for their units (from FHA and VA financing, if sited on a permanent foundation on an approved lot). That condition has sometimes been lacking for standard mobile home construction in the past and has contributed greatly to the year-to-year variation in sales of the mobile units.

SURVEY BACKGROUND

In 1976, modular home construction companies were surveyed in Texas and across the United States to assess the extent of their construction activity and market penetration and to gather some insight into the future of modular residential construction. The survey information attempted to distinguish between modular and mobile homes, realizing that when mobile homes are permanently sited they are indistinguishable from other modular homes. The questionnaire was sent to 196 manufacturers. Of these, 77 responses were received and 48 had useable information. Of the 29 unusable returns, 13 were out of business and 16 returns were incomplete, dealing with other types of construction only or for other reasons.

Information requested covered a wide range of topics including individual construction techniques, square footages, features, per-unit costs, financing methods, sales and aggregation of markets, average shipping distances, unit merchandizing, an assessment of effects of added government regulation, emerging trends and indications of the nature and extent of future industry problems.

CONSTRUCTION PRACTICES

The responding manufacturers' experiences with modular home manufacturing were quite varied. The length of time in the modular construction business ranged

from five months to 17 years. The average was over six years, with five to seven years being a very common response.

The majority (93 percent) of all manufacturers surveyed used wood as the conventional building material. Several indicated using both wood and metal. One manufacturer used concrete exclusively.

All respondents indicated they insulated the walls and ceilings of these units. The most common insulating material was fiberglass. One manufacturer reported using urethane and several others used cellulose fibers. The typical R factor (a measure of resistance to heat gain or loss) of the walls was R-11, and in the ceiling R-19. The R-11 factor would generally indicate fiberglass batts of about a three-inch thickness. For much of Texas the recommended amount (which varies by climatic conditions) of insulation is R-19 in the walls and R-26 in the ceilings. The insulation values reported by the manufacturers are very close to these accepted recommendations and are similar to those of most conventional housing.

More than two-thirds (71 percent) of all manufacturers indicated they had redesigned their basic modular units in an effort to decrease energy needs and costs at the consumer level. Approximately 85 percent indicated more insulation was now used than previously, 70 percent indicated insulated windows were available, while an additional 45 percent said a reduction in window area had been achieved for energy efficiency.

A wide variety of unit sizes were produced by the respondents. The maximum width (where two sections were joined to form the module) was 28 feet. However, the most common width was 24 feet and probably reflects the maximum legal width of 12 feet per unit (14 feet in Texas) allowed to be transported by some states. Length of units ranged from 25 to 65 feet, with the most common lengths being 48 and 60 feet. A unit with dimensions of 24 x 48 feet contains 1,152 square feet. The largest unit (28 x 65 feet) would have 1,820 square feet, which is a large house by

most standards (the average site-built house constructed in Texas in 1976 was about 1,650 square feet). Of all manufacturers surveyed, the average size of their small unit was about 1,100 square feet, their medium size unit was about 1,250 square feet and the large size unit was about 1,425 square feet.

About one-third of the manufacturers indicated their units could be stacked two high to provide second story arrangements. One manufacturer indicated they were producing units to be used as motels, schools and townhouses.

There was an indication more modules would be produced in 1976 than had been produced in 1975. The manufacturers contacted produced a total of 6,271 modular homes in 1975, and their expectations were for a 40 percent increase to about 9,000 units by the end of 1976. This is a minor amount compared to mobile homes (of all manufactured housing, only about half of 1 percent is modular) and conventional site-built housing but a definite trend seems to be developing. For example, manufacturers at the 1977 Southwest Manufactured Housing Show, held in Dallas, Texas, in April 1977, had on display 19 double-wide and modular homes, which represented 13.5 percent of all homes displayed.

Table 1. Average Square Footage and Cost per Square Foot of Selected Size Modular Housing Units[1/]

	Housing Size		
	Small	Medium	Large
Square Feet	1,100	1,250	1,425
Square Footage Cost[2/]	$14.27	$14.07	$11.25

1/ Source: TRERC Modular Housing Survey, 1976.

2/ Excludes furniture which is sometimes sold as a package with the home.

The square footage costs varied considerably from manufacturer to manufacturer. Table 1 shows the average square footages and cost per square foot for the sizes

represented. The average cost was $14.27 per square foot for the small size and $11.25 for the large size, the primary difference being caused by more expensive kitchen and bath components.

Transportation expenses are also a significant part of the overall modular home price. The sample ranged from $.75 per mile to over $5.00, with the average transportation cost per mile of $1.90. An average value of siting was not determined due to the variety of different factors being taken into consideration by the sample respondents. Some included all site preparation costs, including foundation work and water, electrical, sewer or septic tank installation. Others excluded these costs and only included charges for actual installation and leveling of the home on a foundation provided by the lot owner or developer.

Replies varied greatly to the question of what method was used in transporting and siting the modules. Fourteen percent reported using leased hauling equipment and 62 percent reported owning their own equipment. Siting crews were on the payroll of 43 percent of the manufacturers and another 25 percent indicated the method of siting and selection of siting labor was left to the purchaser.

Respondents said the average total costs to purchasers at retail (exclusive of land but including all transportation and siting costs) was about $20 per square foot. This means the small unit identified in Table 1 would sell for about $22,000, the medium-sized unit for $25,000 and the large unit for $28,500. This did not include the cost of land or extras such as carports, furniture, garages, porches or septic tanks which could add substantially to those figures. Depending upon amenities offered with the homes, reported sale prices ranged from $15 to about $30 per square foot.

CONSUMER FINANCING FOR MODULES

Respondents were asked to provide information on the kinds of financing for

which their units qualified in the 1975 production year. Based upon the actual number of units produced by respondents, Table 2 shows the distributions of financing methods. Conventional loans accounted for about three-fourths of all financing with government-insured or guaranteed loans comprising the balance. Cash (no financing required) represented a surprisingly small and insignificant part of the financing methods. The length of mortgage terms were written for as long as 33 years for Farmers Home Administration (FmHA) financing, with the average length of a loan being just under 25 years. The average for conventional financing was just over 23 years.

Table 2. Number of Modular Homes Sold by Type of Financing and Length of Financing Term Available [1/]

Type oF Financing	Percent of Homes Sold Under Each Financial Arrangement	Average Length of Loan
Conventional	74%	23.3 yrs.
FHA-VA	9%	2/
FmHA	15%	31.5 yrs.
Self	1%	3/
Cash	1%	3/

1/ Source: TRERC Modular Housing Survey, 1976.

2/ Insufficient data from sample to generate average figure.

3/ Not applicable.

MARKETING STRATEGIES

Manufacturers were asked to provide information about their market territories, strategies and procedures.

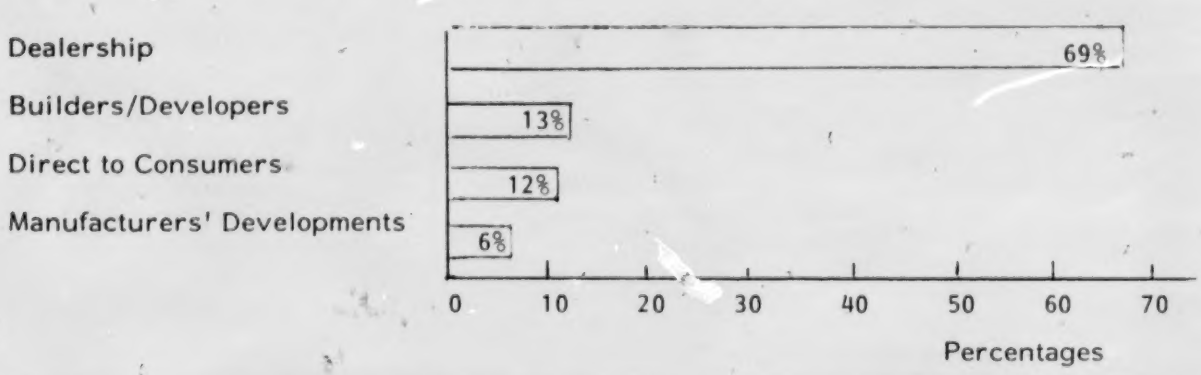
Some manufacturers market units as far as 800 miles from the factory. The average maximum distance was just under 200 miles. The most commonly quoted figure

was 100 miles.

Single-family residences comprised 82 percent of the manufacturing volume of the respondents. Another 11 percent said they were primarily involved in commercial applications.

Figure 1 shows the distribution of sales outlets for the manufactured houses. The majority of sales (69 percent) were accomplished through dealerships. Another 13 percent were sold directly to builders and contractors and an additional 12 percent were sold directly to consumers. The remaining 6 percent were marketed through developments which were owned, backed or otherwise participated in by the manufacturer, a subsidiary or an affiliated company.

Figure 1. Distribution of Marketing Outlets for Modular Home Manufacturers 1/



1/ Source: TRERC Modular Housing Survey, 1976.

GOVERNMENT REGULATIONS

Probably no other sector of the housing industry has been affected more by the inconsistencies in government regulation than the manufactured housing industry. Usually the ordinances at the local level were exclusionary. These restrictions, differing from city to city, have made it difficult to aggregate sufficient markets to produce the volumes necessary to attain efficient production at a competitive price.

Some changes have occurred, and probably will continue, in the direction of unification and consistency in requirements and performance standards, particularly at the state level. The National Mobile Home Construction and Safety Standards Act of 1974 went into effect nationwide in 1976 and provides for federal mobile home construction and safety standards and should improve the quality and durability of all mobile homes currently being produced. This law may set the precedent necessary for unification of local laws which would affect other manufactured housing, and eventually could unify site-built construction standards.

When asked how much cost was added by complying with local codes and requirements, the manufacturers' responses varied from $50 to $1,500 per unit with an average of $386 and a median value of $375. About 25 percent indicated their products were classified as a mobile home or prefabricated unit under some local zoning ordinances. Another 28 percent said they were regulated under local building code requirements, but 39 percent indicated they were not excluded anywhere by being covered under such ordinances. An additional 25 percent of the manufacturers indicated subdivision deed restrictions prevented siting of their units in some locations.

FUTURE TRENDS IN THE MODULAR CONSTRUCTION INDUSTRY

It is clear the modular home industry is dynamic and striving for change. This will cause its market to continue to grow and provide alternatives for housing at various price ranges. Modular housing has re-emerged as a distinct market segment in the housing industry. Nevertheless, it must continue to work for acceptance by consumers.

Table 3 provides a summary of the respondents' attitudes toward various perceived problems. The most significant problem was that of builder acceptance, and all respondents unanimously agreed it may be even more of a problem in the future. Most of the respondents (90 percent) indicated siting being more of a

Table 3. Manufacturers' Responses to Possible Future Problems in the Modular Construction Industry [1/]

Category	Percent Distribution	
	More Problem	Less Problem
Builders' Acceptance	100%	-0-
Siting	90%	10%
Public Attitudes	87%	13%
Meeting Local Codes	77%	23%
Labor	69%	31%
Transportation	66%	34%

[1/] Source: TRERC Modular Housing Survey, 1976.

problem in the future. Other areas receiving high recognition as problem areas included public attitudes (87 percent), meeting local building codes (77 percent), labor (69 percent) and transportation (66 percent).

Table 4 highlights the trends manufacturers see in the modular construction industry. A majority of manufacturers thought the modular home of the future would be more spacious. They also felt manufacturing costs would continue to increase but believed that the cost increases would not be as substantial as those for site-built housing. Thus they expect to become increasingly competitive on a cost basis.

It was a concensus that existing manufacturers would become larger and that smaller firms would be leaving the industry. This situation has already prevailed in mobile home manufacturing and seems likely for the modular construction industry. However, there will not be as much attrition as in the mobile home industry because there are fewer firms in the modular manufacturing industry and many of the new entrants are already firmly established in the highly related mobile home manufacturing market. These firms bring to the modular manufacturing industry

Table 4. Manufacturers's Response to Emerging Trends in the Modular Construction Industry [1/]

Category	Percentage Distribution			
	More/ larger	Same	Less/ smaller	No Response
Size of Unit	75%	18%	7%	0%
Manufacturing Costs	75%	11%	11%	3%
Number of Manufacturers in Industry	61%	21%	14%	4%
Product Differentiation	61%	18%	18%	3%
Emphasis on Residential Construction	46%	36%	11%	7%
Use of Broker/Dealer Franchises	46%	32%	14%	8%
Use of Limited Product Warranties	43%	39%	14%	4%
Product Standardization	43%	32%	18%	7%
Consolidation or Merger of Firms	39%	29%	21%	11%
Use of Company Sales Representation	36%	43%	14%	7%
Size of Sales Territories	25%	36%	29%	10%
Emphasis on Commerical/Industrial Construction	32%	54%	7%	7%

[1/] Source: TRERC Modular Housing Survey, 1976.

competence, technology, financial capacity and stability lacking in certain periods of mobile home manufacturing history.

According to the respondents, product differentiation should continue. This would indicate product competition in the form of quality amenities, not necessarily in price.

Respondents generally thought use of dealer and broker franchises to sell and service the product would continue to expand. Paralleling this trend should be a move toward the increased use of limited warranties on the homes. This could take the form of limited warranties covering the entire product for a stated length of time, excluding only provisions for fair wear under normal use.

Survey repondents indicated sales territories either would remain about the same or become smaller. This could happen because of basic product changes. A major change that could have a tremendous influence is increased size. As the modules become larger, they become more difficult to transport. Some evidence suggests structural damage is directly related to the distance traveled from manufacturing plant to siting.

Increasing emphasis on commercial and industrial modular construction was cited by one-third of the respondents, indicating a desire to become more diversified and offset some of the cyclical risk so prevalent in the residential construction industry.

CONCLUSIONS AND IMPLICATIONS

The modular housing construction industry is in an extremely favorable position. This industry now uses assembly line production techniques to provide a quality product at low and competitive prices. In the wake of inflation and escalating costs, the manufactured housing industry has been able to mimimize these cost increases at least as well as any other segment of the residential construction industry.

The demand for modular housing has been strengthened greatly by the lack of other viable housing alternatives and because it is a type of housing more readily obtainable at a reduced cost with constantly improved quality. Many of the institutional factors that once obstructed the manufactured housing industry are no longer valid, and hence are slowly being removed or changed. The taxation question has been effectively eliminated with modular housing since its siting is permanent, and it is taxed at regular ad valorem tax rates.

The real estate industry in Texas searches constantly for new and innovative ways to serve the needs of consumers. Recent favorable economic conditions, coupled with sustained population increases, have caused the demand for housing in Texas to remain strong. Knowledgeable individuals in the real estate industry generally agree this demand will continue in the future. Thus more and more households may avail themselves of the promising developments the modular construction industry has to offer.